SHUSTIN, Boris Odel'yevich; GUSEV, S.P., red.izd-va; BYKOVA, V.V.,
    tekhn.red.

    [Tables for determining the actual thickness of rocks series:
    including coal seams] Tablitsy dlia opredeleniia istinnoi
    moshchnosti sloev gornykh porod (v tom chisle plastov uglia).
    Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po geologii i okhrane
    nedr, 1960. 96 p.   (MIRA 13:11)
                        (Rocks—Tables)

VANIV, I.V., D LEV, V.Ya. BRIC /I/ E.V. SMITH, B.P.

    program controlled for synthetic milling machine, Stand. in tr.
    35 no.5 al 12 My 1. .   (MIRA 17 10)

L 34487-66   FBD/EWT(l)/EEC(k)-2/T/EWP(k)   IJP(c)   AC
ACC NR: AT6014164   SOURCE CODE: UR/0053/66/088/004/0753/0756

AUTHOR: Velichkina, T. S.; Shustin, O. A.; Yakovlev, I. A.

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvennyy univer-
sitet)

TITLE: Gas laser - lecture demonstrations of its operation and use in physical
laboratory practice

SOURCE: Uspekhi fizicheskikh nauk, v. 88, no. 4, 1966, 753-756

TOPIC TAGS: gas laser, laser application, education

ABSTRACT: The authors indicate that a simple gas laser can be used as an effective
teaching aid and describe several lecture demonstrations that illustrate the oper-
ating principle of the laser and its features as a light source. A gas laser is
shown to be preferable to a solid-state laser since it demonstrates more clearly the
laser principle and is also safer for use in a classroom. Experiments aimed at de-
monstrating the difference between a laser and an ordinary gas discharge, the polari-
zation of the laser emission, the natural directivity of the laser beam, and its
spectral composition are briefly described. A simple interference experiment to
prove the narrowness of the laser line width is described. Besides demonstrating the
laser operating principle, a gas laser can be used to study the fine structure of
spectral lines of light scattered by liquids and crystals (stimulated Mandel'shtam-
Brillouin scattering). The end results of such an experiment is calculation of the

                                                    UDC: 535.0

Card   1/2

ACC NR: AI6014164

speed of sound in different media at a frequency of $\sim 10^{10}$ cps from the interference spectrograms obtained with the aid of a gas laser. This particular demonstration is based on a spectral experiment described by the authors earlier (Pis'ma v redaktsiyu ZhETF v. 2(4), 189, 1965). Some technical data on the laser employed are presented. Orig. art. has: 2 figures and 1 table.

SUB CODE: 20/   SUBM DATE: 00/   ORIG REF: 002/   OTH REF: 003

Card 2/2

Psychophysiology of labor in industry; collected studies of the psychophysiological laboratory. Leningrad, 1925. 275p.

SHUSTIN, V. A.

Mbr., Physiology Inst. im. I. P. Pavlov, Dept, Biol. Sci., Acad. Sci., -c1948-.
"Correlation between the Conditioned Reflexes of the Various Alimentary Organs: I.
Effect of the Heart on the Conditioned Reflexes of the Alimentary System in Dogs."
Fiziol. Zhur. SSSR, 34, No. 3, 1948; "I. P. Pavlov, the Militant Materialist: 100th
Anniversary of his Birth (1849-1949)," Priroda, No. 9.

SHUSTIN, N.A.

Voice reaction in animals and a form of signal activity.
Report no.1. Trudy fiziol. inst. 4:103-112 '49.   (MLRA 9:5)
          (SOUND PRODUCTION BY ANIMALS)

SHUSTIN, N. A.

29251   I. P. Pavlov - voinstvuyushchiy materialist. priroda, 1949, No 9, s. 84-88, s portr.

SO: Letopsi' Zhurnal'nykh Statey, Vol. 39, Moskva, 1949

30940.   SHUSTIN, N. A.

Ivan Petrovich Pavlov--voinstvuyushchiy Materialist. Vracheb-del 10, 1949, No. 10, stb. 877-82

SHUSTIN, N.A.

[Concitioned reflexes in dogs in relation to the weight of
stimulants] Uslovnye refleksy u sobak na otnoshenie razdrazhite-
lei, razlichaiushchikhsia po vesu. Tr.Fiziol.laborat.Pavlova 16:
204-216 '49.   (CLML 19:1)

1. Of the Physiological Institute imeni Academician I.P.Pavlov
of the Academy of Sciences USSR (Director -- Academician L.A.Or-
beli).

SHUSTIN, N.A.

[Voice reaction in animals as a form of signal function] Golosovaia
reaktsiia zhivotnykh kak forma signal'noi deiatel'nosti. Tr.Fiziol.
laborat.Pavlova 16:217-226 '49.   (CLML 19:1)

1. Of the Physiological Institute imeni Academician I.P.Pavlov
of the Academy of Sciences USSR (Director -- Academician L.A.Orbeli).

SHUSTIN, N.A.

Metodology in Pavlov's teaching. Sovet.vrach.sborn. no.17:1-7
5 '49.   (CLML 19:2)

1. Of the Physiological Institute imeni I.P.Pavlov of the Academy
of Sciences USSR.

SHUSTIN, N.A.

Against the reactionary criticism of I.P. Pavlov's teaching of
the function of the central nervous system. Fiziol.zh.SSSR 36 ,
no.4:404-415 July-Aug 50.   (CLML 20:4)

1. Physiological Institute imeni I.P. Pavlov of the Academy of
Sciences USSR.

Nervous system

"Investigation of the higher nervous activity by a natural experiment." Reviewed b V. K.
Fedorskin, . . . Moskva. Zur. vys. nerv. deist. 1 no. , 1951.

Monthly List of Russian Accessions, Library of Congress, April 1952. UNCLASSIFIED.

PA 19373

SHUSTIN, N. A.

USSR/Biology, Medicine - Ideology   Jul/Aug 51

"The Principle of Determinism in I. P. Pavlov's Teaching," N. A. Shustin, Leningrad

"Fiziol Zhur SSSR" Vol XXXVII, No 4, pp 409-421

Praises the principles of determinism on which Pavlov's theory is based and discusses these principles. States that Pavlov's understanding of determinism was in agreement with dialectical materialism.

193T3

Localization of voice section of motor analysers. N. A. Shustin (*J. Physiol., USSR,* 1951, **37**, 562—571).—Barking conditioned reflexes were established in dogs in response to a metronome. These reflexes were abolished and the learning of new ones prevented by bi-lateral removal of the frontal lobes. This did not interfere with barking response to other stimuli, and did not interfere with con-ditioned reflexes involving other effector organs, *e.g.* saliva secretion. Removal of other parts of the brain (parietal, temporal, or occipital lobes) did not affect the barking conditioned reflexes. It is concluded that the motor analysers for voice activities are located in the frontal lobe.
D. H. SMYTH

SHUSTIN, N.A.

Anti-Pavlovian concepts of cortical internal inhibition. Fisiol. zh.
SSSR 38 no. 5:543-552 Sept-Oct 1952.   (CLML 23:3)

1. Leningrad.

SHUSTIN, N.A.

SHUSTIN, N.A.

Successive conditioned ref. s in dogs following the removal of
frontal lobes. Trudy Inst.fiziol. no.2:76-85 '53.   (MLRA 7:5)

1. Laboratoriya fiziologii i patologii vysshey nervnoy deyatel'nosti
(zaveduyushchiy - P.P.Mayorov).
        (Conditioned response) (Brain--Localization of function)

SHUSTIN, N.A.

Method of registering conditioned voice reflexes in higher animals. Zhur.
vys.nerv.deiat. 3 no.2:296-300 Mr-Ap '53.   (MLRA 6:6)

1. Laboratoriya fiziologii i patologii vysshey nervnoy deyatel'nosti In-
stituta fiziologii imeni I.P. Pavlova Akademii nauk SSSR.
                                              (Conditioned response)

SHUSTIN, N.A. (Leningrad)

The second edition of the "Complete works" of I.P.Pavlov. N.A.
Shustin. Zhur. vys. nerv. deiat. 4 no.1:145-150 Ja-F '54.
(MLRA 7:8)

(PAVLOV, IVAN PETROVICH, 1849-1936)

by ____ N. Leonov. Soil Biology Faculty, Leningrad, 1965.
Dissertation for the Degree of Doctor of Biological Sciences.)

so; Referativnyy Zhurnal, No 3 1356

Name: SHUSTIN, Nakhim Abovich

Dissertation: Disturbances of Nervous Activity

Degree: Doc Biol Sci

Affiliation: Inst of Physiology imeni Pavlov, Acad
Sci USSR

Defense Date, Place: 14 May 56, Council of Moscow Order of
Lenin and Order of Labor Red Banner
State U imeni Lomonosov

Certification Date: 29 Sep 56

Source: BMVO 6/57

3461. SHUSTIN N.A. and GILINSKIY Ye.Ya. Lab. for Physiol. and Pathol. of
Higher Nervous Activity and Morphol. Lab., Leningrad. *Disturbances
of cortical activity caused by removal of frontal lobes
(Russian text) TRUDY INST.FIZIOL.I.P.PAVLOVA AKAD.NAUK. 1956,
5 (461-471)Graphs 11 Tables 2

Five dogs showed almost complete inhibition of conditioned reflexes in the first
days after bilateral removal of frontal lobes of the cerebral hemispheres (areas
6, 8, 12 and part of 4). Later, salivary and some motor conditioned reflexes were
reestablished but were weak. Reflexes to strong stimuli (bell) were diminished
more significantly than to weak stimuli (light). Phasic phenomena frequently took
place: equalizing, paradoxical, ultraparadoxical and inhibitory phases. Internal
inhibition was decreased. Vocal conditioned reflexes (barking after conditioned
stimulus) and ability to differentiate weight disappeared after operation; and later
they were neither restored nor formed again. Removal of frontal lobes caused
pathological changes in the cortical cells: chromatolysis, neuronophagocytosis,
vacuolization and cytolysis. Ganglion cells of the cortex showed changes in all
layers and in whole brain from the site of the operation to the occipital pole. It is
believed that changes of the higher nervous activity after removal of frontal lobes
are the result of the cellular pathology in the cerebral cortex. References 18.
Pronin - Moscow

EXCERPTA MEDICA Sec.2 Vol.10/9 Physiol.Biochem. Aug 57

3177. SHUSTIN N.A. *A method of simultaneous investigation of
motor and salivary delayed conditioned reflexes (Russian
text) Ž.VYŠČ NERV.DEJATEL. 1956, 6/2 (338-341) Graphs 1 Tables 1 Illus.
A conditioned-reflex method of investigation of delayed reactions in dogs is
described. Food is put into one of 3 bowls which are visible to a dog standing 1 m.
before them and then all the bowls are covered. After some minutes the dog is
allowed to come to the food-tray to find food. The salivary reaction (by the Ganike-
Kupalov method) and the motor reaction are registered during the whole experiment.
Some observations concerning the behaviour of dogs used in these experiments are
added.   Wyrwicka - Warsaw

SHUSTIN, N.A.

Review of the book by A.I.Karamian on the "Evolution of cerebellar
and cerebral functions." Fiziol.zhur. 43 no.5:484-486 My '57.
        (EVOLUTION)   (CEREBELLUM)   (MIRA 10:12)
        (CEREBRAL CORTEX)   (KARAMIAN, A.I.)

862. PATHOLOGICAL INERTIA OF THE EXCITATORY PROCESS IN THE
MOTOR ANALYSOR FOLLOWING REMOVAL OF THE FRONTAL CERE-
BRAL LOBES (Russian text) - Shustin N. A. Pavlov Inst. of Physiol.,
USSR Acad. of Scis, Leningrad - ZH. VYSSH. NERV. DEYAT. 1958, 8.2
(246-253) Tables 1 Illus. 1

The behaviour of dogs after bilateral extirpation of the frontal cerebral lobes
was studied. As a result of the operation, a pathological inertia of the excitatory
process develops in the motor analysor, in the shape of various disturbances of
the conditioned and the unconditioned reflex activity. The pathological inertia of
excitation arises a few days following the operation, after the end of the period of
the protective inhibition. The physiological mechanism of developing pathological
inertia of the excitatory process apparently consists in a drastic weakening of the
excitation and internal inhibition processes.

SHUSTIN, N.A. (Leningrad)

Problem of studying the function of the frontal lobes of the
cerebral hemispheres. Fiziol.zhur. 44 no.11:1087-1090 N'58.
(MIRA 11:12)
(BRAIN)

SHUSTIN, Naum Arkad'yevich

[Physiology of the frontal lobes of the brain; experimental
research] Fiziologiia lobnykh dolei golovnogo mozga; eksperi-
mental'noe issledovanie. Leningrad, Medgiz, 1959. 222 p.
                                                    (MIRA 13:7)

(BRAIN)

SHUSTIN, N.A.

Differentiation of conditioned proprioceptive stimuli following
bilateral removal of the frontal lobes and other cortical zones.
Trudy Inst.fiziol. 8:88-96 '59.   (MIRA 13:5)

1. Laboratoriya fiziologii i patologii vysshey nervnoy deyatel'-
nosti (zaveduyushchi - F.P. Mayorov) Instituta fiziologii im.
I.P. Pavlova AN SSSR.
          (CONDITIONED RESPONSE)   (BRAIN)

SHUSTIN, N.A.

Some characteristics of animal behavior after bilateral removal of
the frontal lobes of the cerebrum. Nauch. soob. Inst. fiziol. AN
SSSR no.1:84-86 '59.   (MIRA 14:10)

1. Laboratoriya fiziologii i patologii vysshey nervnoy deyatel'nosti
(zav. - F.P.Mayorov) Instituta fiziologii imeni Pavlova AN SSSR.
            (CONDITIONED RESPONSE)   (BRAIN)

SHUSTIN, N.A.

Imitative motor reflex. Fiziol.zhur. 46 no.2:161-166 F '60.
(MIRA 14:5)

1. From the Laboratory for Physiology and Pathology of Higher
Nervous Activity I.P.Pavlov, Institute of Physiology, Leningrad.
(REFLEXES)

SHUSTIN, N.A.

Materialistic and idealistic understanding of the nature of voluntary
movements. Fiziol. zhur. 47 no.10:1227-1234 O '61.   (MIRA 15:1)

1. From J.P.Pavlov Institute of Physiology, Leningrad.
        (MOVEMENT (PHYSIOLOGY)) (MEDICINE--PHILOSOPHY)

SHUSTIN, N.A.

"On the physiology of the frontal lobes."

Report submitted, but not presented at the 22nd International
Congress of Physiological Sciences.
Leiden, the Netherlands   10-17 Sep 1962

SHUSTIN, N.A.

Effect of partial removal and injury of the frontal lobes on the
higher nervous activity in dogs. Trudy Inst. fiziol. 10:184-196'62
(MIRA17.3)

1. Laboratoriya fiziologii i patologii vysshey nervnoy deyatel'-
nosti (zav. - F.P.Mayorov) Instituta fiziologii imeni Pavlova
AN SSSR.

SHUSTIN, N.A.

Effect of bilateral removal of the frontal lobes on retarded reflexes. Nauch.soob. Inst.fiziol. AN SSSR no.3:170-173 '65.
(MIRA 18:5)

1. Laboratoriya fiziologii i eksperimental'noy patologii vysshey nervnoy deyatel'nosti (zav. - F.P.Mayorov [deceased]) Instituta fiziologii imeni Pavlova AN SSSR.

U S S R

U S S R

532.74 : 534.222

6343. Dispersion of sound velocity in certain organic liquids. I. L. FABELINSKII AND O. A. SHUSTIN. *Dokl. Akad. Nauk SSSR*, 92, No. 2, 283–6 (1953); in *Russian* English translation, *U.S. National Sci. Found. NSF-tr-194.*

The velocity of sound at 10 000 Mc/s was measured in benzene, toluene and CCl_4 by finding the frequency shift of the Raleigh lines. The results (together with the percentage positive dispersion with respect to the velocity at about 50 Mc/s) were: benzene, 1470 ± 26 m/s (10%); toluene, 1297 ± 20 m/s (0%); CCl_4, about 1080 m/s (about 16%). If it is assumed that all the excess absorption at ultrasonic frequencies is due to a single relaxation process and that the dispersion is complete at 10 000 Mc/s, then the above figures imply relaxation times of $2 \cdot 4 \times 10^{-10}$ sec for benzene and $6 \cdot 7 \times 10^{-11}$ sec for CCl_4 at 20°c. It is suggested that the relaxation time for toluene is also $\sim 10^{-10}$ sec. The lower excess absorption in this substance would then yield a dispersion of $0 \cdot 1\%$—which is too small to detect and therefore does not contradict the above result. In support of this it is noted that toluene exhibits a sharply defined fine structure and that this would not be possible if α/ω^2 remained constant up to 10 000 Mc/s.   R. O. DAVIES

Phys. Inst. im P. N. Lebedev
AS USSR

22150

S/056/61/040/003/030/031
B112/B214

24.7400

AUTHORS: Shustin, O. A., Velichkina, T. S., Baranskiy, K. N.,
             Yakovlev, I. A.

TITLE: Absorption of sound by Rochelle salt in the neighborhood of
             its lower Curie point

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40,
             no. 3, 1961, 979-980

TEXT: At a temperature in the neighborhood of its upper Curie point
(θ = 24°C) Rochelle salt exhibits an anomalously large absorption of
transverse elastic waves propagating along the z-crystallographic axis and
polarized along the y-axis. This result is given in an earlier paper
(Ref. 1: I. A. Yakovlev, T. S. Velichkina, K. N. Baranskiy, ZhETF, 32,
935, 1957). In the present paper, the absorption of waves polarized in
the manner mentioned above and having a frequency ν = $\omega/2\pi$ = 5 Mc/sec is
investigated for the case of Rochelle salt in the neighborhood of its
lower Curie point (θ = - 18°C). The figure shows the experimental
absorption curve 1 - 1 (crystal temperature T as abscissa, absorption

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B112/B214

Absorption of sound by...

coefficient $\varkappa$ as ordinate). Its theory is by L. D. Landau who has
derived the following formula:

$$\varkappa^2 = \frac{\omega^2 \rho}{2}\left(\mu\left[1 + \frac{8\pi\lambda^2(\mu/\varepsilon + 2\pi\lambda^2)}{\mu^2(\varepsilon^{-2} + 16\pi^2\omega^2\gamma^{-2})}\right]^{1/2} - \mu - \frac{4\pi\lambda^2/\varepsilon}{\varepsilon^{-2} + 16\pi^2\omega^2\gamma^{-2}}\right). \qquad (1)$$

Here, the dielectric constant of the Rochelle salt is given by
$\varepsilon = 4\pi C/(\theta - T)$ for $T < \theta$ and $\varepsilon = 2\pi C/(T-\theta)$ for $T > \theta$, ϱ is the density of the
salt, μ the modulus of shear at constant induction D_x, λ the piezo-
electric constant of the crystal, and γ the coefficient in the kinetic
equation $\partial D_x/\partial t = \gamma \partial\tilde{\Phi}/\partial D_x$ ($\tilde{\Phi}$ the thermodynamic potential of the crystal).
Numerical values are substituted into formula (1), and the following
approximate formula is obtained: $\varkappa = 8\sqrt{\dfrac{\varrho}{\mu}}\dfrac{\pi^2\lambda^2\omega^2/\gamma}{\varepsilon^{-2}+16\pi^2\omega^2\gamma^{-2}}$. It is repre-
sented in the figure by the curve 2 - 2. The good agreement for $T < \theta$
between Landau's theory and the experiment allowed a determination of the
relaxation time τ for $T < \theta$: $\tau = 4\pi\varepsilon/\gamma \approx 3.4 \cdot 10^{-8}/(\theta-T)$ sec. There are
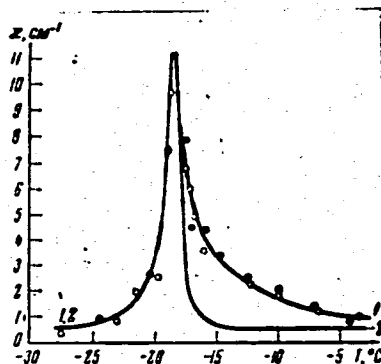
Card 2/3

22150

Absorption of sound by...

S/056/61/040/003/030/031
B112/B214

1 figure and 3 Soviet-bloc references.

ASSOCIATION: Fizicheskiy institut Chekoslovatskoy Akademii nauk, Praga
(Institute of Physics of the Czechoslovakian Academy of
Sciences, Prague)

SUBMITTED: January 7, 1961

Card 3/3

VELICHKINA, T.S.; SHUSTIN, O.A.; YAKOVLEV, N.A.

Michelson interferometer as an instrument for lecture demonstrations.
Usp.fiz.nauk 74 no.2:381-383 Je '61.   (MIRA 14:6)
                        (Interferometer)

39501
S/056/62/043/002/052/053
B108/B102

$\mathcal{Q} \mathcal{U}.l\mathcal{G}OO$

AUTHORS: Baranskiy, K. N., Shustin, O. A., Velichkina, T. S.,
Yakovlev, I. A.

TITLE: Frequency dependence of sound absorption in Rochelle salt
near its upper Curie point

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43,
no. 2(8), 1962, 730

TEXT: Continuing earlier work (ZhETF, 40, 979, 1961; 32, 935, 1957) the
authors studied the frequency and temperature dependences of the
absorption coefficient for transverse waves in Rochelle salt. Measurements
on 5 and 15 Mcps gave the same maximum absorption coefficient $\varkappa$ (Fig.).
The results agree with Landau's approximate formula $\varkappa = A\omega^2/(\mathcal{E}_x^{-2} + B\omega^2)$.
Here, A and B are functions of only the constants of the material. $\mathcal{E}_x$ is
the dielectric constant in the x-direction. There is 1 figure.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University).

Card 1/2

MIKHEYEVA, L.F.; SHETIN, C.A.

Rotation of the polarization plane in quartz near the
temperature of phase transition. Kristallografiia 9
no.3:423-425 My-Je '64.   (MIRA 17:6)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.

L 16578-65   EWT(1)/EPA(s)-2/EWT(m)/EEC(t)/EWP(t)/EEC(b)-2/EWP(b)   Pt-10/
P1-4· ESD(dp)/ESD(gs)/ESD(t)/ASD(a)-5/AS(mp)-2/AFMD(t)/IJP(c)   JD/GG

ACCESSION NR: AP5000296   S/0070/64/009/006/0925/0927

AUTHOR: Shustin, O. A.   B

TITLE: On the ellipsoid of the optical dielectric constant of
quartz near the phase transformation temperature

SOURCE: Kristallografiya, v. 9, no. 6, 1964, 925-927

TOPIC TAGS: quartz, dielectric constant, phase transition, cono-
scopic figure, anisotropy, optical transmission

ABSTRACT: To explain the causes of the ellipticity of light trans-
mitted through a crystal, as described in an earlier paper by the
author (with L. F. Mikheyeva, Kristallografiya v. 9, 3, 1964), cono-
scopic tests were made on quartz experiencing a phase transition.
The tests were made in a special oven shown in Fig. 1 of the enclo-
sure. The free quartz sample was a disc 5 mm in diameter and 0.95
mm thick, but only a small section of the sample, with 1 mm diame-

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ACCESSION NR: AP5000296

O

ter, participated in the formation of the figures. This made it possible to observe conoscopic figures corresponding to only one of the regions of ellipticity or the region of the black band. The phenomenon observed was similar to that seen in the earlier investigation. When the crystal temperature approached the phase-transformation temperature, the surface of the crystal became first brighter, then darker, followed by the maximum transmission (central region of ellipticity), and again by alternating darkening and brightening. The conoscopic figures show that in the temperature region directly adjacent to the phase transition the quartz becomes optically a biaxial crystal. The dark bands correspond to uniaxial quartz. Measurements of the relative intensity and of the angle between the optical axes indicate that in the direct vicinity of the temperature of phase transition, the ellipsoid of the optical dielectric constant of quartz ceases to be an ellipsoid of revolution corresponding to the uniaxial crystal. The quartz is then characterized with a three-axis ellipsoid of dielectric constant in which the difference be-

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L 16578-65
ACCESSION NR: AP5000296

3

tween the lengths of the axis perpendicular to the longitudinal axis
is $\sim 5 \times 10^{-5}$ and depends little on the wavelength of the light. The
fact that the phenomena are observed in a very narrow temperature
interval near the phase-transformation temperature indicates that
certain parameters of the quartz change in the immediate vicinity
of the α-β transition. "I thank T. S. Velichkina and I. A. Yakovlev
for interest in the work." Orig. art. has: 2 figures and 4 formulas.

ASSOCIATION: Moskovskiy gosudarstvenny*y universitet im. M. V.
Lomonosova (Moscow State University)

SUBMITTED: 30Sep63   ENCL: 01

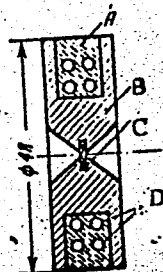SUB CODE: OP, SS   NR REF SOV: 002   OTHER: 000

Card   3/4

L 16578-65
ACCESSION NR: AP5000296

Fig. 1. Diagram of oven.

A - Ceramic, B - oven housing
(steel), C - quartz, D - heating
coil of platinum

Card 4/4

SHUSTIN, O.A.

Ellipsoid of the optical dielectric constants of quartz in a
temperature close to phase conversion. Kristallografiia 9
no.6:925-927 N-D '64.   (MIRA 18:2)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

L 2090-66   EWA(k)/FBD/EWT(1)/EWP(e)/EWT(m)/EPF(c)/EEC(k)-2/EWP(i)/T/EWP(k)/EWP(b)/
EWA(m)-2/EWA(h)   SCTB/IJP(c)   WG/WW/GG/WH
UR/0386/65/002/004/0189/0192
ACCESSION NR: AP5025260

AUTHOR: Velichkina, T. S.; Shustin, O. A.; Yakovlev, I. A.

TITLE: Fine structure of the spectral lines of light scattered by
crystals of cubic symmetry

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v
redaktsiyu. Prilozheniye, v. 2, no. 4, 1965, 189-192, and insert
attached to p. 191

TOPIC TAGS: laser, gas laser, laser application, sound velocity,
Rayleigh component, phonon, crystal

ABSTRACT: The velocity of hypersonic acoustic waves in a series of
crystals of the cubic system $NaCl$, KCl, NH_4Cl + 1% Co and in a low-
temperature modification of quartz crystals was determined from ordinary
(spontaneous) Brillouin components generated by the coherent light
scattered in the crystal.   The light from an He-Ne laser (λ = 6328 Å),
concentrated into a 0.5 mm^2 beam, passed through the crystal onto a
concave reflector and then back through the crystal and into the laser.
Fine adjustment of another reflector in front of the laser made it

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L 2090-66
ACCESSION NR: AP5025260   3

possible to reduce the multiply reflected beam into one coinciding with
the primary beam and to thus obtain a four-fold enhancement in the
intensity of the scattered light. Also, the power output of the laser
increased slightly. The linearly polarized E vector from the laser
was perpendicular to the scattering plane and was directed parallel to
one of the edges of the crystal lattice. The quality of the spectro-
grams obtained using laser excitation was limited only by the degree
of the perfection of the crystal. The sound velocities obtained by
measuring the shift of the Rayleigh satellites ($\Delta\lambda$) are summarized in
Table 1 of the Enclosure together with the sound velocities calculated
from data on the elastic constants of the crystals. Orig. art. has:
2 figures and 1 table.   [CS]

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomono-
sova (Moscow State University)

SUBMITTED: 22Jun65   ENCL: 01   SUB CODE: SS, EC

NO REF SOV: 000   OTHER: 008   ATD PRESS:

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L 2090-66
ACCESSION NR: AP5025260

Table 1.   Satellite displacement $\Delta\lambda$ and sound velocity Δv data

Crystal	Longitudinal wave			Transverse wave		
	$\Delta\lambda$, Å	V_{exp} (m/sec)	V_{theor} (m/sec)	$\Delta\lambda$, Å	V_{exp} (m/sec)	V_{theor} (m/sec)
NH_4Cl + Co	0.228 ±0.001	4650 ±25	4430	0.117 ±0.001	2380 ±25	2110
NaCl	0.204 ±0.002	4450 ±50	4480			
KCl	0.169 ±0.003	3820 ±70	3830			

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ACC NR: AP6020797   SOURCE CODE: UR/0386/66/003/012/0491/0494

AUTHOR: Shustin, O. A.

ORG: Physics Department of the Moscow State University im. M. V. Lomonosov
(Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta)

TITLE: Scattering of light in the phase transition of the NH4Cl crystal

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu.
Prilozheniye, v. 3, no. 12, 1966, 491-494

TOPIC TAGS: light scattering, Rayleigh scattering, ammonium compound, single
crystal, light polarization, phase transition

ABSTRACT: The purpose of the investigation was to check on an assumption that the
intense Rayleigh scattering observed in quartz near the phase transition point
(573C) is not an exclusive feature of second-order phase transitions, and that
the intensification of light scattering should occur also in first-order transi-
tions if the crystal transition heat is small and the fluctuations of the crystal-
lattice parameters can be appreciable near the phase transition region. The
author has therefore carried out experiments on NH4Cl single crystals, similar to
those described by I. A. Yakovlev and T. S. Velichkina (Uspekhi fiz. nauk v. 63,

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L 32206-66
ACC NR: AP6020797   4/

411, 1957, and earlier) for quartz. A block of NH_4Cl cut parallel to the edges of the unit-cell cube of the crystal lattice was placed in a cryostat. The primary light beam was parallel to one of the edges of the cubic lattice. The electric vector in the primary light beam was perpendicular to the scattering plane. A photomultiplier was used to measure the intensity of the light scattered by the crystal at 90° to the primary beam. Two simultaneous sets of observations were made, one with the scattered light having the same polarization as the primary light, and another with the light incident on the photomultiplier having its electric vector in the plane of incidence. In both series the measurements were made on the 4358 and 5460 Å mercury lines. The results of both series demonstrate convincingly the expected intensification of the scattering light during the phase transition of the NH_4Cl crystal. The temperature dependence of the scattered-light intensity showed marked dependence on the polarization. The author thanks L. A. Sherbakova and G. K. Chirkin for growing optically perfect NH_4Cl single crystals and T. S. Velichkina and I. A. Yakovlev for interest in the work. Orig. art. has: 2 figures.

SUB CODE: 20/   SUBM DATE: 16Apr66/   ORIG REF: 003/   OTH REF: 002

Card 2/2

ACC NR: AP7003531   SOURCE CODE: UR/0386/67/005/001/0006/0009

AUTHOR: Shustin, O. A.; Yakovlev, I. A.; Velichkina, T. S.

ORG: Physics Department, Moscow State University im. M. V. Lomonosov (Fizicheskiy fakul'tet Moskovskogo Gosudarstvennogo Universiteta)

TITLE: Absorption of sound in single-crystal NH$_4$Cl during its phase transformation

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 5, no. 1, 1967, 6-9

TOPIC TAGS: ammonium compound, chloride, phase transition, Curie point, sound absorption

ABSTRACT: The authors measured the absorption of longitudinal acoustic waves propagating along the edge of the crystal cubic lattice. The measurements were made at 5 and 15 MHz by a method described earlier (ZhETF v. 32, 935, 1957). Particular attention was paid to the thermal conditions of the experiments. The investigated crystal samples were in acoustic contact with a metallic thermostat-controlled delay line. This entire system was placed in turn in a massive copper thermostat isothermal with the delay line. Similar results were obtained for the absorption coefficient at both frequencies, but at 5 MHz the maximum absorption was one-fourth that for 15 MHz. Reduction of the experimental data yields a relaxation time $\tau = 1 \times 10^{-9}/(\theta - T)$ sec, which agrees in order of magnitude with the value obtained by others. The authors were also able to obtain for the first time the value of $d\theta/dp$ (θ = phase transition

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ACC NR: AP7003531

temperature, p = pressure) from acoustic measurements, getting a value 9×10^{-9} deg-cm^2/dyne which agrees with the published data. This is regarded as a confirmation of Landau's theory. The authors thank L. A. Shcherbakova and G. K. Chirkin for supplying the NH_4Cl crystals. Orig. art. has: 2 figures and 2 formulas.

SUB CODE: 20/   SUBM DATE: 28Sep66/   ORIG REF: 004/   OTH REF: 005

Card 2/2

SAMOTOKIN, B.A.; SHUSTIN, V.A.; GORBATSEVICH, A.B.

"Problems in modern neurosurgery." Reviewed by B.A.Samotokin,
V.A.Shustin, A.B.Gorbatsevich. Vop.neirokhir. 23 no.4:57-60
Jl-Ag '59.   (MIRA 12:10)
              (NERVOUS SYSTEM--SURGERY)

SAMOTOKIN, B.A.; GORBATSEVICH, A.B.; SHUSTIN, V.A.

Use of hypothermia in neurosurgical operations. Vop.neirokhir.
24 no.1:21-26 Ja-F '60.   (MIRA 13:10)
            (HYPOTHERMIA)   (BRAIN--SURGERY)

GORBATSEVICH, A.V., kand.med.nauk; SHUSTIN, V.A., kand.med.nauk (Leningrad)

Diagnosis and surgical treatment of chronic subdural hematomas.
Vop.neirokhir. no.5:21-23 '61.   (MIRA 14:11)

1. Klinika neyrokhirurgii Voyenno-meditsinskoy ordena Lenina
akademii imeni S.M. Kirova.
        (HEMATOMA)   (DURA MATER—TUMORS)

SHUSTIN, V.A.; IVANOVA, T.T. (Leningrad)

Angioreticuloma in the region of the gasserian ganglion. Vop.
neirokhir. 25 no.3:58-59 My-Je '61.   (MIRA 14:5)

1. Kafedra neyrokhirurgii Voyenno-meditsinskoy ordena Lenina
akademii imeni S.M. Kirova.
                    (BRAIN—TUMORS)

SHUSTIN, V.A.

Diagnosis and treatment of secondary discogenic radiculitis
of the lumbar region. Vop. psikh. i nevr. no.9:261-260 '62.
(MIRA 17:1)

1. Kafedra neyrokhirurgii Voyenno-meditsinskoy ordena
Lenina akademii imeni S.M. Kirova.

SHUSTIN, V.A., kand.med. nauk   (Leningrad)

Movement of fragments of an intervertebral disk in the spinal
canal. Vop. neirokhir. 26 no.6:49-51 N-D'62   (MIRA 17:3)

1. Kafedra neyrokhirurgii Voyenno-meditsinskoy ordena Lenina
akademii imeni S.M.Kirova, Leningrad.

KONSTANTINOV, V.A.; SHUSTIN, V.A.

Surgery to create soundless barking in dogs. Eksper. khir. i
anest. 8 no.4:54-55 Jl-Ag '63.
(MIRA 17:5)

1. Nauchno-issledovatel'skaya razgovaya laboratoriya kafedry
gospital'noy khirurgii No.1 (nachal'nik-prof. I.S. Kolesnikov)
i kafedry neyrokhirurgii (nachal'nik - dotsent B.A. Samotokin)
Voyenno-meditsinskoy ordena Lenina akademii imeni S.M. Kirova.

SHUSTIN, V.A., dotsent; STAROVOYT, V.V. (Leningrad)

Compression of the spinal cord in cervical osteochondrosis.
Vop. neirokhir. 27 no.2:24-28 Mr-Ap '63.   (MIRA 17:2)

1. Kafedra neyrokhirurgii (nachal'nik B.A. Samotokin)
Voyenno-meditsinskoy ordena Lenina akademii imeni S.M.
Kirova.

BRUSTIN. I.A. kand. med. nauk, STAROV   V.V.

Neurologic syndromes in cervical osteochondrosis. Sov. med. 27 no.3:
94-97 Mr '64.   (MIRA 17:11)

1. Kafedra neyrokhirurgii (nachal'nik - dotsent B.A. Samotokin)
Voyenno-meditsinskoy ordena Lenina akademii imen' Kirova, Leningrad.

CHISTEN, V.A., MALYSHEVA, K.G.; TSEKHANOVSKIY, B.G.

Segmental radicular leucocytosis in lumbar diskogenic radiculitis.
Zhur.nevr. i psikh. 63 no.12:1792-1797 '63.   (MIRA 18:1)

1. Klinika neyrokhirurgii (nachal'nik - dotsent B.A.Samotokin)
Voyenno-meditsinskoy ordena Lenina akademii imeni S.M.Kirova.

AUTHOR: Shustina, A. L., and Luchanskaya, N. M.

TITLE: Investigation of Barium Vaporization From Directly Heated Oxide-Coated Cathode of Economical Battery-Type Tubes (Issledovaniye ispareniya bariya s pryamonakal'nogo oksidnogo katoda lamp ekonomichnoy batareynoy serii)

ABSTRACT: The causes of 2P2P-tube cathode-emission instability are investigated. One of the fundamental causes of sharp changes in parameters of an under-heated tube during its lifetime is vaporization of barium from the cathode. To determine the rate of vaporization, an experimental tube with two cathodes (oxide-coated and tungsten) has been used. The tungsten-cathode emission varied depending on the amount of barium sprayed from the adjacent oxide-coated cathode. The time period necessary to build the maximum emission

Card 1/2

9(4), 24(0)

Investigation of Barium Vaporization From Directly Heated Oxide-Coated . . . .

from the tungsten cathode has been determined, and the barium evaporation rate has been calculated. The relation between the transconductance of an underheated-cathode tube and barium vaporization has been found. If the tube is run without useful current, barium disintegrates more quickly. With a small load current, the cathode emission falls off with decrease in current; with a large load current, the cathode emission falls off with increase in current (apparently, because of excessive electrolysis).

Ya.B.G.

Card 2/2

SHUSTINA, A.L.; ABALDUYEV, B.V.; GORFINKEL', B.I.; ZAGREBNEVA, S.V.

Studies of a cold MgO cathode. Radiotekh. i elektron. 7 no.9:1539-
1546 S '62.   (MIRA 15:9)
        (Cathodes)   (Electron tubes)

SOV/129-58-9-13/16

AUTHORS: Gayvoronskiy, L. A., Shustitskaya, Ye. V. and Popov,K.V.

TITLE: Investigation of the Low Temperature Stability of the
             Steel SKhL-4 After Various Types of Heat Treatment
             (Issledovaniye khladostoykosti stali SKhL-4 posle
             razlichnoy termicheskoy obrabotki)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, Nr 9,
             pp 54-55 (USSR)

ABSTRACT: 20 mm thick steel sheet was investigated in the heat
            treated state.   The composition of the steel was:
            0.12% C; 0.77% Mn; 0.9% Si; 0.022% S; 0.024% P; 0.84% Cr;
            0.56% Ni.   The influence of the heat treatment on the
            low temperature stability was evaluated on the basis of
            the change of the critical temperature of transformation
            of the steel into the brittle state during impact bending
            of notched specimens.   As the critical temperature, the
            upper boundary of the brittleness temperature range was
            chosen.   In cases when the decrease in the impact strength
            was continuous the critical temperature was considered
            arbitrarily that temperature for which the impact strength
            was 40% below the respective value at room temperature.
  Card 1/4. For determining the tendency of the specimen to ageing in

SOV/129-58-9-13/16

Investigation of the Low Temperature Stability of the Steel SKhL-4
After Various Types of Heat Treatment

the as delivered state it was subjected to an extension
by 10% with subsequent two hour tempering at 200°C. The
properties of the steel after various types of heat
treatment are entered in the Table, p 54. It can be seen
that hardening from the optimum temperature of 920°C,
followed by high temperature tempering, brought about
almost no change in the low temperature stability
compared to the as delivered state. However, over-
heating during hardening by only 40°C brought about an
increase in the critical brittleness temperature from
-90 to -50°C. In Fig.1 the changes are graphed of the
impact strength at various test temperatures for the as
delivered state and after deformation ageing. Deformation
ageing brought about a considerable reduction of the
impact strength at the investigated temperatures but the
coefficient of sensitivity to ageing was 0.3, which
justifies the assumption that this steel has a low
sensitivity to deformation ageing. Annealing of the
steel affected the low temperature stability in the same
Card 2/4 way as deformation ageing. Application for the steel

SOV/129-58-9-13/16

Investigation of the Low Temperature Stability of the Steel SKhL-4
After Various Types of Heat Treatment

SKhL-4 of this widely used softening as the final heat
treatment is not recommended in cases in which the
manufactured components should have a high low temperature
stability. After normalisation annealing at 920°C a
certain decrease was observed in the impact strength and
an increase in the critical temperature; after normalisa-
tion without over-heating, the steel maintains a high
impact strength down to -70°C (Fig.2). It is recommended
that this type of heat treatment should be tried in
industry for certain components in cases in which a
better heat treatment (hardening followed by high
temperature tempering) cannot be effected for technological
reasons or where such a treatment would be difficult to
carry out. In the case of heat treatment, and particularly
of welding of the steel SKhL-4, it is necessary to bear
in mind that over-heating to 1100°C followed by cooling
in air (see Fig.2) is capable of increasing appreciably
the tendency of steel to brittle fracture.

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SOV/129-58-9-13/16

Investigation of the Low Temperature Stability of the Steel SKhL-4
After Various Types of Heat Treatment

There are 2 figures and 1 table.
(Note: This is a complete translation except for the figure
captions and table)

ASSOCIATION: Vostochno-Sibirskiy filial AN SSSR
(East Siberian Branch of the Ac.Sc., USSR)

1. Steel--Mechanical properties   2. Steel--Heat treatment
3. Steel--Test methods

Card 4/4

S/137/61/000/005/053/060
A006/A106

AUTHOR: Shustitskaya, Ye. V.

TITLE: Improving the method of singling out austenite grains of low-alloy
            low-carbon steels

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 5, 1961, 40, abstract 5I313
             (V sb. "Materialy i Konferentsii molodykh nauchn. sotrudn. [Vost.-
             Sib. fil. Sib. otd. AN SSSR] no. 3" Blagoveshchensk, 1960, 85-87)

TEXT: To improve the etching ability of austenite grains it is suggested
to employ quenching from a temperature requiring the evaluation of the grain size,
with subsequent holding in a range of developing temper brittleness (for the
steels investigated from 350 to 450°C). The investigations were made on a group
of low alloy steel grades such as 20X (20Kh), 20XГ (20KhG), 20XГC (20KhGS), 20ГC
(20GS) and CXЛ-4 (SKhL-4). The method of chemical treatment suggested for the
singling out of austenite grains includes the etching of sections, prepared after
quenching from a corresponding temperature and tempering at 450°C. The etching
solution is composed of 7 volumetric portions of 10% oxalic acid solution,

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S/192/62/003/002/004/004
D267/D301

AUTHOR: Shustorovich, M.

TITLE: Nature of chemical bonds in phosphonitrile dichloride and in some kindred compounds

PERIODICAL: Zhurnal strukturnoy khimii, v. 3, no. 2, 1962, 218 - 219

TEXT: Both Craig (Craig, D.P., J. chem. Soc. 1959, 997) and Dewar (Dewar, M.J.S., et. al., J.chem. Soc. 1960, 2423) ignore the part played by the unshared pair of nitrogen electrons in the formation of chemical bonds. It follows from available data that the degree of participation of this pair increased with the increase of n in the polymer $(NPCl2)_n$. This participation explains also the instability of $NPCl_2$ and of $(NPCl_2)_2$. It can be inferred that $(NPCl_2)_n$ is a system not of conjugated, but rather of accumulated bonds $P \leftrightharpoons N = P$. Corresponding structures are suggested for $NNbCl_2$ and $NTaCl_2$; although the chemical stability of these compounds

Card 1/2

MOR EKHODOV, G.A.; SHUSTOROVICH, M.L. [deceased]; BELYAYEV, A.V.;
GRIGOR'YADI, M.G.; KOMNOVA, A.V.

Adequate thickness of Russian leather. Kozh.-obuv.prom. 2
no.2:21-23 F '60.   (MIRA 13:5)
            (Leather)

MOREKHODOV, G. A., inzh.; SHUSTOROVICH, M. L., kand.tekhn.nauk [deceased];
ZYBIN, Yu. P., doktor tekhn.nauk, prof.

Investigating regularities of thickness distribution throughout
the entire skin of Russian leather used for shoe manufacture.
Report No.1: Characteristics of thickness distribution throughout
the skin of Russian leather during its manufacture. Izv.vys.ucheb.
zav.;tekh.leg.prom. no.4:86-95 '61.

(MIRA 14:10)

(Leather—Testing)

SHUSTOROVICH, V.M., inzh.

Determining the carrying capacity of an antifriction thrust
bearing in case of the eccentric application of axial force.
Vest.mashinostr. 42 no.9:19-24 S '62.   (MIRA 15:9)
                        (Bearings (Machinery))

TSELIKOV, A.T., akademik; MOROZOV, B.A., doktor tekh. nauk; SHUSTOROVICH, V.M., inzh.; GARTSMAN, S.D., inzh.

Selecting the optimum diameter for the supporting rolls of four-high rolling mills. Vest.mashinostr. 45 no.9:24-26 S '65.
(MIRA 18:10)

SHUSTOROVICH, V.M., inzh.; MOROZOV, B.A., doktor tekhn.nauk

Studying the strength of a 55 ton charge oxygen-blown converter under operating conditions. Stal' 25 no.5:404-407 My '65.
(MIRA 18:6)

SHUSTOROVICH, YA. A.

AUTHOR: Shustorovich, Ya.A., Engineer.   114-8-7/16

TITLE: Calculations on the bending of turbine discs. (Raschet turbinnykh diskov na izgib.)

PERIODICAL: "Energomashinostroyeniye" (Power Machinery Construction), 1957, Vol.3, No.8, pp.24-26 (U.S.S.R.)

ABSTRACT: Uneven heating of the lateral surfaces of a disc, the influence of axial forces of working medium on the blades, pressure differences and deviation of the centre of gravity of the blades from the middle of the disc, all cause bending stresses in discs. In some cases these stresses can be quite great and should be calculated. The best known methods of making calculations on the bending of discs are those developed by R.S. Kinasoshvili and I.A. Birger. These methods are laborious and the present article proposes a two-calculation method to determine the bending stresses in a disc. S.A. Tumarkin calculated the bending stresses by a two-calculation method but he does not allow for uneven heating of the disc.
    A detailed mathematical analysis is then given of the bending of a disc of constant thickness with different temperatures on the two sides. The formulae are applicable to calculations on a disc of variable thickness if it is considered as being divided up into individual cylindrical discs.

Card 1/2

114-8-7/16
Calculations on the bending of turbine discs. (Cont.)

The application of the method to a disc of variable profile
such as that shown in Fig. 1 is illustrated by an example.
Fig. 2 is a graph of calculated values of temperature expansion
along the radius of the disc and the results of the stress
calculation are plotted in Fig. 3 where corresponding figures
calculated by other published methods are also given. The
stress differences in the two cases result from lack of corres-
pondence between the functions of thermal expansion over the
radius in the corresponding calculations.
There are 3 figures, 1 table and 3 Slavic references.
AVAILABLE: Library of Congress
Card 2/2

SHUSTOROVICH, Ia.A., inzhener.

Design of turbomachine discs with the effect of plastic deformation bending taken into account. Teploenergetika 4 no.9:85-87 S '57.
(MIRA 10:8)

(Turbomachines)

SHUSTORCVICH, Ya. A., Candidate Tech Sci (diss) -- "Engineering methods of computing the strength of the disks of turbine machines". Leningrad, 1959. 11 pp

(Leningrad Shipbuilding Inst), 150 copies (KL, No 22, 1959, 118)

SHUSTOROVICH, Ya.A., inzh.; PETROV, N.P., inzh.

Calculating diesel installations operating with pulsating loads. Energomashinostroenie 6 no.3:16-18 Mr '60.
(MIRA 13:6)

(Diesel engines)

SHUSTCROVICH, Ya.A., inzh.

   Stretching of the disks of half-open wheels of radial turboma-
   chines. Energomashinostroenie 9 no.11:18-22 N '63.   (MIRA 17:2)

SHUSTOROVICH, Ya.A., inzh.

    Buckling of semiopen runners of radial-flow turbomachines.
    Energomashinostroenie 11 no.10:32-35 O '65.

                                     (MIRA 18:11)

SHUSTOROVICH, YE.M.

20-6-28/47

AUTHORS: Dyatkina, M. Ye., Shustorovich, Ye. M.

TITLE: The Molecular Orbits of Systems Made up of Condensed Five-,
               Six- and Seven-Member Rings (Molekulyarnyye orbity sistem
               iz kondensirovannykh pyati-, shesti-i semichlennykh kolets)

PERIODICAL: Doklady AN SSSR, 1957, Vol. 117, Nr 6, pp. 1o21-1o22 (USSR)

ABSTRACT: The authors are interested in the molecular orbits of the
               systems of 3 condensed rings with five- and seven-member
               cycles and the calculated the energies of the molecular orbits
               of such systems by the usual method in the approximation ЛКАО.
               The results of calculation expressed by the Coulombian
               integrals C and by the resonance-integrals β are given in a
               table, where the energies of all suitable and also of the two
               lowest unsuitable molecular orbits are given. The authors'
               calculations confirm a conclusion of Dewar and Petitt
               (reference 3, 4). In different systems, according to these
               calculations, the number of suitable molecular orbits is equal
               to the number of the existing pairs of π-electrons, so that
               such systems must exist in the form of neutral molecules.
               Structural formulae with double bonds and with all tetra-
               valent C-atoms may be ascribed to them. In a certain system

Card 1/3

The Molecular Orbits of Systems Made up of Condensed   20-6-28/47
Five-, Six- and Seven-Member Rings

with 11 π-electrons 6 suitable orbits exist, so that such a
condensed system must be inclined to the addition of an
excess electron under formation of $C_{11}H_{11}^-$. The pentanyl,
however, has no such inclination. But in another system only
7 suitable molecular orbits and 15 π-electrons exist, so
that the cycle $C_{16}H_{16}$ in the form of a single-charged cation
must be stable. The results for two of the systems investigated
here are called especially interesting. In the first one of
those the authors found 6 suitable molecular orbits so that
10 π-electrons exist. Therefore the cycle $C_{10}H_{10}$ is supposed
to be inclined to the addition of 2 excess electrons under
formation of a double-charged anion. In the second case of
special interest 16 π-electrons and only 7 suitable molecular
orbits exist, so that such a system must be inclined to
giving off 2 electrons with transition to a double-charged
cation. Therefore such a condensed system is supposed to con-
sist of three seven-member rings in the form of the salt
$(C_{16}H_{16})^{2+}X^{2-}$. There are 1 table, and 4 references, 0 of
Card 2/3   which are Slavic.

·The Molecular Orbits of Systems Made up of Condensed   20-6-28/47
Five-, Six- and Seven-Member Rings

ASSOCIATION: Institute of General and Inorganic Chemistry AS USSR
imeni N. S. Kurnakov (Institut obshchey i neorganicheskoy
khimii imeni N. S. Kurnakova Akademii nauk SSSR)

PRESENTED: June 29, 1957, by I. I. Chernyayev, Academician.

SUBMITTED: June 26, 1957

AVAILABLE: Library of Congress

Card 3/3

AUTHORS: Shustorovich, Ye. M., Dyatkina, M. Ye.   SOV/78-3-12-20/36

TITLE: I. The Valence State of the Elements of the First Transition Period in Bi-Cyclopentadienyl Compounds (I. Valentnyye sostoyaniya elementov pervogo perekhodnogo perioda v bis-tsiklopentadienil'nykh soyedineniyakh)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 12, pp 2721-2735 (USSR)

ABSTRACT: In the present work a systematic calculation was made for the energies of the valence states of the first transition period elements (from Sc to Ni) in bis-cyclopentadienyl compounds (several valence states were calculated for each atom) using the method of (Slater) Sleyter-Kondon . In the molecules of these compounds exist the following bonds: unpaired electrons in the e_{1g} orbit and $d_{xz} d_{yz}$ orbits of the metals; electron pairs in the a_{1x}, a_{2u}, e_{1u} orbits and in the free orbits of the corresponding metals, s, p_z, p_x, p_y; electron pairs in the $d_{x^2-y^2}$, d_{xy} and free e_{2g} orbits. The relatively low energy of the valence state of the Ti^+ and V^{2+} permits the formation of

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SOV/78-3-12-20/36

I. The Valence State of the Elements of the First Transition Period in Bi-Cyclopentadienyl Compounds

the compounds $(C_5H_5)_2$ Ti^+ and $(C_5H_5)_2$ V^{2+}, but e_{2g} bonds are lacking in these compounds. From the results obtained it is possible to explain the difference in the properties of the scandium compounds and those compounds of Ti^+ and V^{2+}, which have a corresponding number of electrons. It is also possible to explain the diamagnetic properties of $(C_5H_5)_2$ Ti, the paramagnetism of $(C_5H_5)_2$ V', the magnetic properties of $(C_5H_5)_2$ Mn and $(C_5H_5)_2$ Fe^+, the diamagnetism of ferrocene, the instability of $(C_5H_5)_2$ Ni, and the formation of ring compounds of Cu with cyclopentadienyl. There are 2 tables and 14 references, 2 of which are Soviet.

SUBMITTED: October 10, 1957

Card 2/2

5(4)
AUTHORS: Dyatkina, M. Ye., Dobryakov, S. N.,   SOV/20-123-2-28/50
               Shustorovich, Ye. M.

TITLE: The Molecular Orbits of Radicals With Non-Alternant Cycles
               (Molekulyarnyye orbity radikalov s neal'ternantnymi tsiklami)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 2, pp 308-311
   (USSR)

ABSTRACT: The authors first discuss the characteristic features of
               systems with non-alternant cycles which were determined by an
               earlier paper (Ref 1). These results induced the authors to in-
               vestigate also other compounds with five- and seven- membered
               cycles, namely radicals which are analogous to diphenyl methyl
               and dinaphtyl methyl with cyclopentadienyl-, cycloheptatrienyl-,
               and azulenyl residues. Calculations were carried out by the
               simplified method of molecular orbits under usual conditions.
               The systems investigated are given in a table, where also
               the number of connecting (svyazyvayushchiy), non-connecting
               (nesvyazyvayushchiy), and separating (razrykhlyayushchikh)
               levels of these molecules are mentioned. Various details con-
               cerning these systems are given; the following conclusions may
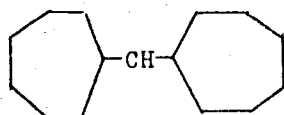
Card 1/3   be drawn:

The Molecular Orbits of Radicals With Non-Alternant   SOV/20-123-2-28/50
Cycles
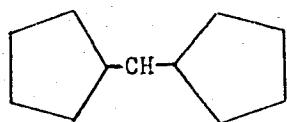
must, like the radical cyclopentadienyl,

be stable in form of a singly charged anion, and

in form of a singly charged cation, as

e.f. tropyl. In the same way also such systems must behave in
which, apart from the non-alternant ring, also a condensed
6-membered ring exists. The radicals with heptalinyl rests have
a non-connecting level. Finally, some structural common
features and differences between the structure of the systems
listed in the table are pointed out. There are 1 table and 3
references, 2 of which are Soviet.

Card 2/3

DYATKINA, M.Ye.; DOBRYAKOV, S.N.; SHUSTONOVICH, Ye.M.

Molecular orbitals of radicals with nonalternating rings. Dokl.AN
SSSR 123 no.2:308-311 N '58.   (MIRA 11:12)

1. Predstavleno akademikom I.I. Chernyayevym.
   (Radicals (Chemistry)) (Electrons) (Chemical structure)

SOV/78-4-2-25/40

5(4)
AUTHORS:

Dyatkina, M. Ye., Shustorovich, Ye. M.

TITLE:

The Valence States of the Central Atoms in Aromatic Complexes of Metals (Valentnyye sostoyaniya tsentral'nykh atomov v aromaticheskikh kompleksakh metallov)

PERIODICAL:

ABSTRACT:

The valence state of the central atoms in aromatic complex compounds of the type $(C_6H_6)_2Me$ (Me = V^+, V, Cr^+, Cr, Mo, and Fe^{++}) is discussed. The excitation energies of the basic state and of the various valence states of the configurations d^4, s^2d^3, d^5 and d^6 are shown in detail in table 1. Considering the excitation energies in the various valence states, the diamagnetic properties of dibenzene chromium, dibenzene molybdenum, and of divalent dibenzene iron can be explained. The excitation energies were calculated on account of the valence state of the individual atoms and are shown in table 2. The energy of the individual combinations in the compounds of the type dibenzene-chromium can be calculated from the

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The Valence States of the Central Atoms in Aromatic Complexes of Metals

energies of the various valence states. The donor-acceptor functions between the electronic couples of the benzene cycle and the free orbitals of the central atom, sa_{1g} and $de\pm_{1g}$ are decisive in the case of these compounds. There are 2 tables and 6 references, 2 of which are Soviet.

SUBMITTED: November 1, 1957

Card 2/2

5(4)

AUTHORS: Shustorovich, Ye. M., Dyatkina, E. Ye.   SOV/78-4-3-11/34

TITLE: The Valence States of the Central Atoms in the Aromatic
               Complexes of Metals (Valentnyye sostoyaniya tsentral'nykh
               atomov v aromaticheskikh kompleksakh metallov)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 3,
               pp 553 - 558 (USSR)

ABSTRACT: In the formation of bis-cyclopentadienyl compounds of the
               elements of the second and third transition periods the
               elements of the second and third transition periods the
               valence state is similar to that of the elements of the first
               transition period and is characterized by odd electrons in

               shells d_{xz}, d_{yz} ($e_{1g}^{\pm}$). The difference between the excitation
               energies of Fe (110 kcal) and Ru (35-37 kcal) in a corresponding
               valence state is responsible for the higher stability of
               ruthenocene compared to ferrocene. In view of the magnitude
               of the energy of $(C_5H_5)_2Zr$ this compound is believed to be
               diamagnetic. 61 kcal (instead of 82 kcal with titanium) are

Card 1/3   required to excite the d^4 configuration in zirconium. For

The Valence States of the Central Atoms in the Aromatic   SOV/78-4-3-11/34
Complexes of Metals

this reason the bonds for forming bis-cyclopentadienyl
compounds are more favorable in zirconium than in titanium.
The difference between the energy of the valence states

$d_{xz}d_{yz}d^+_{x^2-y^2}2d^+_{z^2}2$ and $d_{xz}d_{yz}d^2_{x^2-y^2}2$ is 12 kcal. A comparison has
shown that the energy of the valence state of rhenium is lower
than that of manganese. The energy required for exciting

rhenium d^7 is 72 kcal, for manganese d^7 it is 132 kcal. The
energy difference is one of the main causes for the difference
in properties between manganese and rhenium. Manganese does
not form compounds, rhenium forms the compound $(C_6H_6)_2Re^+$.

The excitation energies of Mn and Re in a corresponding
valence state have not been compared because there are no data
on the rhenium spectra. The excitation energy in the

d^3 configuration of yttrium is near that of scandium (97 kcal)
and amounts to 84 kcal. In the case of yttrium and scandium,
ionogenic tricyclopentadienide is formed. The valence states
Card 2/3   in the cyclopentadienyl compounds of nickel, palladium,and

The Valence States of the Central Atoms in the Aromatic SOV/78-4-3-11/34
Complexes of Metals

platinum have been discussed. Palladium shows the initial
state d^9p with an excitation energy of 110 kcal. Platinum has
the valence state d^9s and differs from the initial states of
nickel and palladium. This state is favorable for combining
the platinum atom with 2 chlorine atoms and 2 ethylene
molecules in cis-configuration. The structure of platinum
cyclopentadienyl in the initial state has electron
configurations which favor the formation of donor-acceptor
bonds and dative bonds with two double bonds. There are
9 references, 3 of which are Soviet.

SUBMITTED: December 23, 1957

Card 3/3

5(3)

AUTHORS: Sarycheva, I. K., Shustorovich, Ye. M., SOV/79-29-4-32/77
              Vorob'yeva, G. A., Preobrazhenskiy. N. A.

TITLE: Synthesis of the 7-Cyano-2,6-Dimethyl, and 2,3,6-Trimethyl-
              Heptadienes-2,6 of the Nitriles of the Geranic and 3-Methyl
              Geranic Acids (Sintez 7-tsiano-2,6-dimetil- i 2,3,6-trimetil-
              geptadiyenov-2,6, nitrilov geraniyevoy i 3-metilgeraniyevoy
              kislot)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 4, pp 1189-1192
              (USSR)

ABSTRACT: In the terpene series the synthesis of the nitrogenous
              compounds is of importance since they (e. g. amines and nitriles)
              render possible the synthesis of geraniol, citral, geranic
              acid and numerous homologues (Ref 1). The present article
              contains a description of the synthesis of the nitriles of
              geranic acid (I,R=H) and 3-methyl geranic acid (I,R=CH$_3$)
              starting from 2 -methylheptene-2-on-6 (IV,R= H) and,
              accordingly, from 2,3-dimethylheptene-2-on-6 (IV, R=CH$_3$)

Card 1/3   (Pattern 1). Compound (IV,R=H) is synthesized as initial

Synthesis of the 7-Cyano-2,6-Dimethyl, and   SOV/79-29-4-32/77
2,3,6-Trimethyl Heptadienes-2,6 of the Nitriles of the Geranic and 3-Methyl
Geranic Acids

product from (II,R=H). This alcohol is transformed (Ref 2)
into the bromide (III,R=H) which is condensed by acetic
anhydride (Ref 3) in the presence of magnesium. In order to
arrive at (I,R=H), (IV,R=H) is transformed with cyanoacetic
acid. Compound (I,R=H) is also obtained by transformation of
(IV) with ethyl cyanoacetate and subsequent selective
saponification and decarboxylation of the compound (V, R=H)
obtained. Similarly, the synthesis of the nitrile of the
compound $(I,R=CH_3)$ is carried out, namely by the transformation

of $(IV,R=CH_3)$ with the ethyl cyanoacetate. The structure of

the initial product (I) was proved according to pattern 2.
The divergency found between the physicochemical constants of
the synthetic nitrile of geranic acid (I,R=H) and those of
the nitrile prepared from natural citral (IX) (Ref 6) is
explained by the differences in the relative stereoisomer
contents (Ref 7) (last pattern). There are 7 references,
4 of which are Soviet.

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